

Serial No. 09/834,238

REMARKS

1. This paper is responsive to the office action of April 21, 2004.

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2. In brief, the present invention is method and apparatus for the removal of strobe artifacts.

3. Claims 1-7 and 52-56 were rejected under 35 U.S.C. § 102 (b) as being

10 anticipated by Abe (US 5,568,194). The Examiner stated that, "For claim 1, Abe discloses a method for removing flash artifacts (figures 1 and 3) comprising the steps of: ... d) applying a threshold to said difference image to create an artifact image (in steps 112 and 114, the luminance of difference image is compared with the threshold values S1 and S2 giving results of steps 113, 115 and 116; step 113 provides an artifact image); and e) subtracting said artifact image from said second digital image, resulting in a final digital image (steps 117 and 188 provide a final image after white balance adjustment or correction to remove flash artifacts)." First, Abe does not disclose a method for removing flash artifacts.

15 Abe's invention is a method for adjusting the white balance in an image captured using a flash. Adjusting the white balance involves shifting colors within the image, not with removing glare or other such flash artifacts as described in applicant's application. Abe's invention is incapable of removing glare from an image, it is able only to adjust the white balance of the glare to make the color look realistic, not to actually reduce or remove the glare. Also, step 113 does not 20 in fact provide an artifact image. As described by Abe, "Step 113 is executed in

Serial No. 09/834,238

which the coefficients *Ab* and *Ar* of the white balance adjustment reset based on the flash of light..." Abe is setting the values of *Ab* and *Ar* in step 113, and the setting of these coefficients does not provide an artifact image, it simply sets the coefficients used in step 117 to adjust the white balance of the pixel or block of pixels. The color data for the pixel or block of pixels is *multiplied* by these coefficients, while in applicant's invention, a separate artifact image is created by applying a threshold to a difference image, and this artifact image is then *subtracted* from the flash image. This is a completely different operation than that disclosed by Abe. While Abe does use a difference image and does apply a threshold to that difference image, Abe does not create an artifact image, and does not subtract that artifact image from the flash image as in applicant's invention. Thus, claim 1 is distinct from the invention disclosed by Abe and in a condition for allowance.

4. Claim 2 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated that, "For claim 2, Abe discloses a method for removing flash artifacts wherein said artifact image is multiplied by a factor (column 4, lines 18-28; differential color signals are multiplied by coefficients *Ab* and *Ar*) before the step of subtracting said artifact image from said second digital image." However, as the Examiner states above, in Abe's invention *differential color signals* are multiplied by the coefficients, not an *artifact image* as shown in applicant's invention. Applicant's artifact image is created by applying a threshold to the difference image, resulting in an artifact image. Regarding claim 1, the Examiner claimed that steps 117 and 118 (which involve multiplying the differential color signals by the coefficients) are the same as subtracting said artifact image from said second digital image. However, here

Serial No. 09/834,238

regarding claim 2, the Examiner now claims that these same steps are the same as multiplying said artifact image by a factor before the step of subtracting said artifact image from said second digital image. Neither comparison is correct. Adjusting the color values of one or more pixels by multiplying them with one or 5 more white balance coefficients is not equivalent to the step of creating an artifact image and subtracting that artifact image from the flash image. Also, it is not equivalent to the step of multiplying an artifact image by a factor before subtracting that artifact image from the flash image. And it certainly is not equivalent to both of these steps performed within a single method for removing 10 flash artifacts. Thus, claim 2 is distinct from the invention disclosed by Abe and in a condition for allowance. Also, since claim 2 is dependent upon independent claim 1, it includes all of the limitations of claim 1, which itself has been shown above to be patentably distinct from Abe and thus is itself distinct from Abe even without the further distinction shown above.

15 5. Claim 3 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated that, "For claim 3, Abe discloses a method for removing flash artifacts wherein said artifact image is offset by a factor before said step of subtracting said artifact image from said second digital 20 image (column 4, lines 18-28)." However, once again, this component of Abe's invention involves multiplying the differential color signals by the white balance coefficients (column 4, lines 23-25). It does not use an artifact image and it does not offset (implying addition or subtraction) an artifact image by a factor. As discussed above, adjusting the color values of one or more pixels by multiplying 25 them with one or more white balance coefficients is not equivalent to the step of creating an artifact image and subtracting that artifact image from the flash image.

Serial No. 09/834,238

Also, it is not equivalent to the step of offsetting an artifact image by a factor before subtracting that artifact image from the flash image. Thus, claim 3 is distinct from the invention disclosed by Abe and in a condition for allowance.

Also, since claim 3 is dependent upon independent claim 1, it includes all of the 5 limitations of claim 1, which itself has been shown above to be patentably distinct from Abe, and thus claim 3 is distinct from Abe and in a condition for allowance, even without the further distinction shown above.

- 10 6. Claim 4 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated that, "For claim 4, Abe discloses a method for removing flash artifacts wherein said difference image comprises intensity data (column 3, lines 52-65; column 4, lines 13-17)." While Abe's difference image does comprise intensity data, this difference image is used in a 15 completely different manner than it is used in applicant's invention, as discussed above. Since claim 4 is dependent upon independent claim 1, it includes all of the limitations of claim 1, which itself has been shown above to be patentably distinct from Abe, and thus claim 4 is distinct from Abe and in a condition for allowance.
- 20 7. Claim 5 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated that, "For claim 5, Abe discloses a method for removing flash artifacts further comprising the step of: f) storing said final digital image in a memory device (column 4, lines 48-52)." While Abe does store the final digital image in a memory device, applicant's claim 5 is dependent 25 upon independent claim 1, it includes all of the limitations of claim 1, which itself

Serial No. 09/834,238

has been shown above to be patentably distinct from Abe, and thus claim 5 is distinct from Abe and in a condition for allowance.

8. Claim 6 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by
5 Abe (US 5,568,194). The Examiner stated that, "For claim 6, Abe discloses a method for removing flash artifacts wherein said threshold can be set by a user (column 5, lines 45-58; S1 and S2 are predetermined threshold values, but can be adjusted by the user of the camera which is inherited in operating of the camera)." However, this segment of Abe's patent does not even mention a user, much less
10 the ability of a user to adjust the values of S1 and S2. In fact, these two thresholds are called "standard values" by Abe which seems to teach away from the possibility of allowing a user to adjust these parameters. Thus claim 6 is distinct from Abe and in a condition for allowance. Also, since claim 6 is dependent upon
15 independent claim 1, it includes all of the limitations of claim 1, which itself has been shown above to be patentably distinct from Abe, and thus claim 6 is distinct from Abe and in a condition for allowance, even without the further distinction
shown above.

9. Claim 7 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by
20 Abe (US 5,568,194). The Examiner stated that, "For claim 7, Abe discloses a method for removing flash artifacts wherein said threshold is calculated from a histogram of said difference image (figure 5 reads on histogram)." However, Abe's Figure 5 is not at all related to a histogram. A histogram is a bar chart representing a frequency distribution, where the heights of the bars represent
25 observed frequencies. Abe's Figure 5 is a graph of the relationship between "the amount of light radiated by the flash, reflected from the object and received at the

Serial No. 09/834,238

- camera lens ... [versus] the object difference" (column 5, lines 45-47). This is not a histogram since it does not relate at all to a frequency distribution as required by any standard definition of the term histogram. Thus claim 7 is distinct from Abe and in a condition for allowance. Also, since claim 7 is dependent upon independent claim 1, it includes all of the limitations of claim 1, which itself has been shown above to be patentably distinct from Abe, and thus claim 7 is distinct from Abe and in a condition for allowance, even without the further distinction shown above.
- 10 10. Claim 52 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated, "For claim 52, see the rejection of claim 1 above." Applicant relies on his rebuttal of the rejection of claim 1 given above.
- 15 11. Claim 53 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated, "For claim 53, see the rejection of claim 4 above." Applicant relies on his rebuttal of the rejection of claim 4 given above.
- 20 12. Claim 54 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated, "For claim 54, see the rejection of claim 5 above." Applicant relies on his rebuttal of the rejection of claim 5 given above.
- 25 13. Claim 55 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by Abe (US 5,568,194). The Examiner stated, "For claim 55, see the rejection of

Serial No. 09/834,238

claim 6 above." Applicant relies on his rebuttal of the rejection of claim 6 given above.

14. Claim 56 was similarly rejected under 35 U.S.C. § 102 (b) as being anticipated by
5 Abe (US 5,568,194). The Examiner stated, "For claim 56, see the rejection of
claim 7 above." Applicant relies on his rebuttal of the rejection of claim 7 given
above.

15. For these reasons, this application is considered to be in condition for allowance
10 and such action is earnestly solicited.

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Respectfully submitted,

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Page 8 of 8

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